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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/307,956	05/10/1999	JAMES R. SCHNEIDER	13394	5537

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EXAMINER	
ISABELLA, DAVID J	
ART UNIT	**PAPER NUMBER**
3738	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/307,956	SCHNEIDER, JAMES R.	
	Examiner	Art Unit	
	DAVID J. ISABELLA	3738	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *27-57* is/are pending in the application.

4a) Of the above claim(s) *48,49 and 54-57* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-47 and 50-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Status of the Claims

Amendments to the claims were filed on 12/13/2006. Claims 27-38,44,46,47,48,49 were amended. Claims 50-57 were newly added. Claims 38-47 are directed to a preserved vessel and claims 48-49 as amended remain directed to a method for implanting a vessel. New claims 50 and 51 are dependent on claims 27 and 39, respectively. New independent claims, claim 52 as well as dependent claim 53, are directed to a vascular graft similar to the subcombination as presented in claim 27. Most noticeably, the combination of a removable stent is missing from the claim. Claims 54-57 are directed to the combination of a contained preserved vessel. These claims do not require that the vessel be a vascular graft as set forth in claims 27-37. Moreover, independent claim 38 remains directed to a preserved vessel and not distinctly to a vascular graft as set forth in claims 27-36.

Election/Restrictions

Amended claims 48 and 49 remain directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: method does not require the specific product of claims 27-47. Moreover, the product of claims 27-47 may be used in a different method than that as set forth in claims 48 and 49.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 48 and 49 remain withdrawn from

consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

With respect to newly submitted claims 54-57, these claims are directed to a new combination not previously considered. The combination includes a canister, vacuum seal, preserved vessel and removable stent. The scope of the combination claim does not require the specifics of the graft of claims 27-37, nor does it require the specifics that the vessel comprises tissues from vein, artery or that the vessel be a straight or branching segment. As such the combination does not require the particulars of the subcombinations of claims 27-47.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 54-57 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

In summary, currently claims 48,49 and 54-57 are withdrawn from consideration as being drawn to non-elected invention. Claims 27-47,52 and 53 are pending for immediate consideration.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2738,50,51,52 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the recitation of "low antigenicity", does not reasonably provide enablement for "high patency and integrity". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. Applicant's specification does not provide reasonable support to define the metes and bounds of the limitation of "high patency and integrity" as related to preserved vessel isolated from the umbilical cord and/or placenta.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 27,38,50,51,52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application

was filed, had possession of the claimed invention. Applicant's attempt to define the vessel for use in an adult human is not clearly supported in the original specification. Additionally, applicant's attempt to define the vessel as exhibiting **high** patency and integrity is not clearly supported in applicant's original specification. Examiner notes that applicant's first introduction of the term "high patency" was in applicant's amendment filed on 5/10/1999. The term "integrity" was added in applicant's amendment filed on 12/14/2000. The term "low antigenicity" was present in the original claims as filed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 30and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 30 and 40 are directed to a combination that is outside of the parameter of the preamble of claim 27, from which it depends. It is not clear if applicant is positively claiming the combination of the graft and the canister or if the applicant is merely claiming that the graft is adapted to be subjected to a vacuum and contained in a canister. If applicant is attempting to claim the combination, the preamble of the claim must be amended to allow for the proper incorporation of such combination. As the claim is currently written, the limitation in the body of the claim serves to further define

the "vascular graft" and not the vehicle which may serve to contain the same. As interpreted, examiner maintains that the vessel of the prior art, as applied, is capable of being stored in a canister under vacuum.

Claim Rejections - 35 USC § 102

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 38 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Dardik, et al (3894530).

Dardik, et al discloses a preserved vessel suitable for implantation as a vascular graft produced by direct freeze-drying without chemical denaturing of a vessel isolated from a human umbilical cord or human placenta, wherein the preserved vessel exhibits low antigenicity and the preserved vessel being substantially free of fetal blood.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 27-34,38-44, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt (Publications Laryngoscope 96: 1986; 29th Ann. Meeting of Amer Society for

Head and Neck Surgery: 1987) in view of Dardik et al (3894530) and further in view of McDonald et al (6090136).

The publications to Pratt discloses the use of freezed-dried microarterial allografts that have reduced immune response and good patency when implanted. In each of the publications, Pratt suggests that free dried placental vessels should be explored as microarterial allografts. Pratt, on page 628, discloses that a similar study by Chow, using freezed dried placental heterograft/allograft vessels as vascular substitute. The venous allograft was not harvested from a placental source, however it is clear from the studies by Pratt and Chow that freeze dried tissues exhibit low antigenicity and as, allografts, good patency. The basic question remains would it have been obvious to one with ordinary skill in the art to harvest venous from placental tissues.

The earliest of Dardik, et al work teaches that placental and umbilical tissues have been used as a source for microarterial vessels for reconstructive surgery. In fact, Dardik teaches that these vessels may be freeze-dried prior to use. In light of the teachings of Dardik, et al, i.e. the use of vessels derived from placental and/or umbilical tissues as a source of microarterial allografts that can be freezed-dried to yield a reconstructive allograft that exhibits low immune response would have been obvious to one with ordinary skill in the art at the time of the invention thereof. In so far as patency of the tissue, works by Pratt (in association with the inventor) and Chow seem to point to the use of freeze-dried vessels as being suitable for transplantation. Clearly the use of placental vessels as allografts would reduce the inconveniences and traumas associated with harvesting autogeneous venous vessels.

With respect to the limitation of the use of a removable stent in combination with the vessel, examiner points to the McDonald, et al patent as teaching the combination of using removable stents used in combination with natural vessels depending upon the in vivo requirements of the vessels.

The limitations of the dependent claims 28, 29,31,32,33,34 are fully met by combination of Pratt and Dardik, et al.

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Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dardik, et al (3894530) as applied to claim 52 above, and further in view of McDonald et al as applied to claim 27 supra.

With respect to the limitation of the use of a removable stent in combination with the vessel, examiner points to the McDonald, et al patent as teaching the combination of using removable stents used in combination with natural vessels depending upon the in vivo requirements of the vessels.

Claims 35-37,45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pratt, Dardik, et al and McDonald et al as applied to claims 27 and 38, respectively, and further in view of Lau, et al and Chin.

McDonald, et al is silent as to the use of polyamides however Dardik, et al suggest the broad use of polyesters as the material for stent construction. Lau, et al teaches the specific use of polyamides as well as elastic alloys (eg. nitinol) to reinforce umbilical derived tissues. To use nylon as a stent for reinforcing the tissue of Pratt

would have been obvious from the combined teachings of McDonald et al and Lau, et al to provide a vessel with more support in vivo.

Chin teaches the use of bifurcated stent graft derived from umbilical source. To use stents in bifurcating vessels would have been obvious from the teachings of Chin as a means for providing additional vessel support in vivo.

Response to Arguments

Applicant's arguments filed 12/13/2006 have been fully considered but they are not persuasive. The prior art of Dardik et al along with the articles of Pratt clearly disclose the freeze-drying of the graft thereby establishing that the process was known at the time of the invention.

Applicant argues that Pratt discloses studies in rabbits using freeze-dried arterial allografts made from femoral or brachial arteries. While examiner agrees with the basis of the study, examiner directs applicant's attention to page 628 of Laryngoscope 96, disclosing that Chow studied freeze-dired placental yessels as heterografts/allografts and found that heterografts stimulates a stronger immune reaction than an allograft.

terial autografts in the rabbit femoral artery.[4] A similar study by Chow compared freeze-dried microarterial allografts to autografts in the rat.[5] He reported 84% patency of the freeze-dried allografts at 1 to 3 months. Chow more recently studied freeze-dried human placental vessels as heterografts in the rabbit and reported a 55% patency rate at 3 months.[6] Although freeze-drying only retarded the process of host immune reaction to a heterograft in Chow's study, it seemed to prevent an immune response to the allograft in this study. It would appear that a heterograft, as expected, stimulates a stronger immune reaction than an allograft and, therefore, would not make as good a vascular substitute. A good topic for further investigation would be the study of freeze-dried human placental vessels used as microarterial allografts. Success with such an investigation would provide a readily available source of vascular grafts without the inconvenience and additional morbidity associated with harvesting autogenous veins.

Examiner's reliance on Dardik, et al clearly establishes that use of vessels derived from placental and umbilical tissues have been used as a source for microarterial graft. Pratt clearly established, prior to the invention herein, that lyophilization of vessels reduces the vessel's immune response and exhibits good patency, especially, when as used as an allograft. The basic question remains, would it have been obvious to one with ordinary skill in the art to harvest venous from placental tissues.

The earliest of Dardik, et al work teaches that placental and umbilical tissues have been used as a source for microarterial vessels for reconstructive surgery. In fact, Dardik teaches that these vessels may be freeze-dried prior to use. In light of the teachings of Dardik, et al, i.e. the use of vessels derived from placental and/or umbilical tissues as a source of microarterial allografts that can be freezed-dried to yield a reconstructive allograft that exhibits low immune response would have been obvious to one with ordinary skill in the art at the time of the invention thereof. In so far as patency

of the tissue, works by Pratt (in association with the inventor) and Chow seem to point to the use of freeze-dried vessels as being suitable for transplantation. Clearly the use of placental vessels as allografts would reduce the inconveniences and traumas associated with harvesting autogeneous venous vessels. Applicant has not clearly established that the use of placental source for harvesting vessels would not have been obvious to one with ordinary skill in the art at the time of the invention thereof. Applicant has not provided any evidence that vessels derived from placental tissues have different architecture or physical properties not suitable for tissue transplantation.

Applicant argued that the Office has failed to establish a prima facie case of obviousness for failure to meet at least one of the three required criteria set out above - namely, reasonable expectation of success. Examiner respectfully, disagrees with applicant's assertion. It is clear that lyophilization of vascular vessels including those derived from the placenta have achieved success in reduction of immunogenicity and when used as allografts possesses good patency.

Dardik et al discloses the use of vessels derived from placental source and teaches that these isolated vessels may be freeze-dried prior to use. Examiner contends that at the time of the invention thereof, it has been clearly demonstrated by Pratt and Chow (and others) that lyophilization is successful in reducing the immune response to treated vascular vessels, especially as used as an allograft. Moreover, Chow study indicated that lyophilized placental vessels were successful as a source for microarterial graft exhibiting reduced immunogenicity. Examiner maintains that the prior

art points to a reasonable expectation of success in using lyophilized umbilical vessels as a source for microarterial graft.

With respect to applicant's arguments to the step of removing and/or inserting the stent into the vessel, such limitations are directed to a method for employing the stent and the claims are directed to the apparatus comprising the combination. In interpreting the claim, the prior art must be capable of performing the function as claimed by applicant, whether or not the prior art is used in the same manner is not required to be shown. In light of McDonald, Lau and Chin, applicant's argument is moot. Whether the stent remains in place or is removed, the combination is still rendered obvious as argued by the examiner. The claim is directed to the positive combination of the preserved vessel and the stent.

Applicant respectfully submitted that two of the three required characteristics recited in the claims are not properly addressed: - high patency and integrity. Examiner has reviewed applicant's specification for support of these characteristics and has not been able to find support for the two characteristics as set forth in the claims. Accordingly, the examiner has applied rejections under 35 USC 112 first and second paragraphs.

In addition, applicant argued that vessels of umbilical cord and placenta are subjected only to human fetal blood pressure that is much lower than human adult blood pressure. As detailed in the §1.132 declaration, fetal blood pressure is usually in the range of about 60/25 mmHg, while healthy adult blood pressure is about 140/80 mmHg. Blood pressure associated with human adult hypertension is even greater (160/120

mmHg). Accordingly, it was surprising that grafts produced by freeze-drying umbilical cord or placental vessels would withstand at least twice or more the blood pressure than that to which the fresh tissue is subjected in nature. Applicant has attempted to amend the claims to require the use of the vessel in an adult human. Again, while such use may be implied in the original specification, the specification as originally filed does not support the newly added language of the claims. Moreover, it is not clear as to how the isolated vessels physically differ from other venous vessels such that it would have been unexpected or surprising that the placental derived vessels would withstand higher pressures.

With respect to applicant's Declaration under Rule 1.32, the declaration is not commensurate with the scope of the invention as claimed. Applicant's attempt to amend the claims to align the subject matter with applicant's declaration has been treated essentially as not having antecedent support in the specification as originally filed.

The Schneider Declaration provides evidence that preserved vessels prepared by freeze-drying placental or umbilical cord vessels maintain sufficient integrity for use as grafts, and further can withstand pressure similar to that found in an adult. While applicant argues that freeze drying may destroy the integrity of the vessels, no evidence was presented supporting that freeze drying placental vessels differs from freeze drying umbilical vessels. According to Chow and admitted by Pratt, success was reasonably expected with umbilical vessels that have undergone lyophilization.

Applicant's declaration with respect to utilization of the vessels in situations with increased pressure is not well taken.

Applicant's statement:

Similarly, there was no reasonable expectation that freeze-dried vessels could be used in an adult graft and withstand at least twice or more the blood pressure than that to which the fresh tissue is subjected in nature.

The claims are devoid of such language and limitations and thus applicant's arguments pertaining to the manner in which the grafts are used are moot. Moreover, the statement is incorrect, in that, a study by Chow appears to indicate that the graft would have sufficient integrity and immunological properties after grafting.

Applicant's assertion that the studies above demonstrate that umbilical cord and placental vessels can be preserved by freeze-drying according to the invention and maintain sufficient integrity to be useful as grafts in a human adult has been noted, however the statement and corresponding arguments are not commensurate with the scope of the claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID J. ISABELLA whose telephone number is 571-272-4749. The examiner can normally be reached on MONDAY-FRIDAY.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CORRINE MCDERMOTT can be reached on 571-272-4754. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DAVID J ISABELLA
Primary Examiner
Art Unit 3738

DJI
1/10/2007